"Estimation of best linear approximations to set identified functions", Paul Schrimpf with Arun G. Chandrasekhar, Victor Chernozhukov, and Francesca Molinari

Preliminary draft available on request.

We consider the estimation of the set of best linear approximations to a set identified function. We extend the partial identification literature by allowing our bounds to by any estimable functions, potentially even indexed by some parameter. Characterizing the identified set via its support function, we develop the limit theory for the support function and prove that the function approximately converges to a Gaussian process. Limit inference results and the validity of a Bayesian bootstrap is proved as well. The bounds may be estimated by either non-parametric or parametric means and may carry an index. This nests the canonical examples in the literature– interval valued outcome data and interval valued regressor data in mean regression– as special cases. Since the bounds may carry an index, our method covers applications beyond mean regression. These include quantile and distribution regression with interval valued data, sample selection problems, as well as mean, quantile, and distribution treatment effects. Moreover, our framework allows for the utilization of instruments. To illustrate our framework, we perform simulations for the quantile treatment effect in the selection model and, as an example, study female labor participation along the lines of Mulligan and Rubinstein (2008).